



NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-424 and 50-425; NRC-2023-0093]

Southern Nuclear Operating Company; Vogtle Electric Generating Plant, Units 1 and 2

AGENCY: Nuclear Regulatory Commission.

ACTION: Exemption; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) has issued an exemption in response to a request dated June 30, 2022, as supplemented by letters dated September 13, 2022, and January 20 and May 5, 2023, from Southern Nuclear Operating Company to allow the use of lead test assemblies (LTAs) 7ST1, 7ST2, 7ST3, and 7ST4, each with four fuel rods with a maximum nominal Uranium 235 (U-235) enrichment of up to six percent by weight for up to two cycles of operation at Vogtle Electric Generating Plant, Unit 2, and to receive, inspect, and store the LTAs at Vogtle, Units 1 and 2.

DATES: The exemption was issued on August 1, 2023.

ADDRESSES: Please refer to Docket ID **NRC-2023-0093** when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- **Federal Rulemaking Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2023-0093**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: Stacy.Schumann@nrc.gov. For technical questions, contact the individual listed in the "For Further Information Contact" section of this document.

- **NRC's Agencywide Documents Access and Management System**

(ADAMS): You may obtain publicly available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please

contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, at 301-415-4737, or by email to PDR.Resource@nrc.gov. The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in this document.

- **NRC's PDR:** The PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: John G. Lamb, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-3100, email: John.Lamb@nrc.gov.

SUPPLEMENTARY INFORMATION: The text of the exemption is attached.

Dated: August 2, 2023.

For the Nuclear Regulatory Commission.

John G. Lamb,
*Senior Project Manager,
Licensing Plant Branch 2-1,
Division of Operating Reactor Licensing,
Office of Nuclear Reactor Regulation.*

Attachment – Exemption from 10 CFR 50.68(b)(7) to Allow the Use of Lead Test Assemblies, 7ST1, 7ST2, 7ST3, and 7ST4, each with four fuel rods with a maximum nominal Uranium 235 (U-235) enrichment of up to six percent by weight for up to two cycles of operation at Vogtle, Unit 2, and to receive, inspect, and store the LTAs at Vogtle, Units 1 and 2.

NUCLEAR REGULATORY COMMISSION

Docket Nos. 50-424, and 50-425

Southern Nuclear Operating Company

Vogtle Electric Generating Plant, Units 1 and 2

Exemption

I. Background.

Southern Nuclear Operating Company (SNC, the licensee) is the holder of Facility Operating License Nos. NPF-68, and NPF-81, for the Vogtle Electric Generating Plant (Vogtle), Units 1 and 2, respectively. The licenses provide, among other things, that the licenses are subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

The Vogtle, Units 1 and 2, consist of two pressurized-water reactors located at the licensee's site in Burke County, Georgia.

II. Request/Action.

By letter dated June 30, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22181B156), as supplemented by letters dated September 13, 2022 (ML22256A198), and January 20 (ML23020A148) and May 5, 2023 (ML23125A269), SNC requested an exemption to title 10 of the *Code of Federal Regulations* (10 CFR), part 50, section 50.68, "Criticality accident requirements," paragraph (b)(7) for Vogtle, Units 1 and 2.

Specifically, SNC requested an exemption from 10 CFR 50.68(b)(7) to allow the

use of lead test assemblies (LTAs) 7ST1, 7ST2, 7ST3, and 7ST4 each with four fuel rods with a maximum nominal Uranium 235 (U-235) enrichment of up to six percent by weight for up to two cycles of operation at Vogtle, Unit 2, and allow receipt, inspection, and storage of the LTAs at Vogtle, Units 1 and 2.

The regulation at 10 CFR 50.68(b)(7) states, "The maximum nominal U-235 enrichment of the fresh fuel assemblies is limited to five (5.0) percent by weight."

III. Discussion.

Pursuant to 10 CFR 50.12, the NRC may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR part 50, including 10 CFR 50.68(b)(7) when: (1) the exemptions are authorized by law, will not present an undue risk to the public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. Under 10 CFR 50.12(a)(2), special circumstances include, among other things, when application of the specific regulation in the particular circumstances would not serve, or is not necessary to achieve, the underlying purpose of the rule.

A. The Exemption is Authorized by Law.

In accordance with 10 CFR 50.12, the NRC may grant an exemption from the requirements of 10 CFR part 50 if the exemption is authorized by law. The exemption requested in this instance is authorized by law, because no other prohibition of law exists to preclude the activities which would be authorized by the exemption.

This exemption would allow the licensee to insert four LTAs each containing four fuel rods with a maximum nominal U-235 enrichment of up to six percent by weight. A specific nominal U-235 enrichment in 10 CFR 50.68(b)(7) is at the discretion of the Commission consistent with its statutory authority. No statute required the NRC to adopt this specification. As stated above, 10 CFR 50.12 allows the Commission to grant

exemptions from the requirements of 10 CFR part 50. The NRC staff has determined that granting of an exemption from 10 CFR 50.68(b)(7) related to nominal U-235 enrichment of up to six percent by weight will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemption is authorized by law.

B. The Exemption Presents no Undue Risk to Public Health and Safety.

SNC stated the following in its letter dated June 30, 2022:

The Vogtle reactors each contain 193 fuel assemblies. Each assembly consists of a matrix of 264 Zircaloy, ZIRLO™^[®], or Optimized ZIRLO®^[TM] clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide (UO₂) as fuel material, not to exceed 5 wt% [weight-percent] enrichment. The proposed change is to load four LTAs with advanced ATF [accident-tolerant fuel] features, including ADOPT fuel [2], AXIOM cladding [3], chromium coating, and four rods per LTA with up to 6 wt% enrichment, in limiting core locations for up to two cycles of operation.

This exemption will not present an undue risk to public health and safety. The analysis performed in support of the enclosed LAR [license amendment request] addresses the safe storage of the LTAs. These were evaluated using AOR [analysis of record] plant-specific models to determine that existing storage configurations can be used for storage of the LTAs, with restrictions (see Section 3 above and Section 3.12 of Enclosure 1 [in letter dated June 30, 2022]). Thus, the granting of this exemption request will not pose an undue risk to public health and safety.

The licensee's requested exemption to paragraph 50.68(b)(7) is for the fuel rods enriched above 5.0 wt% U-235. Each LTA is limited to four rods at 6.0 wt% U-235. Those four rods add about 0.015% more U-235 to the LTAs relative to the Vogtle new fuel storage rack (NFSR) analysis of record (AOR) and the Vogtle spent fuel pool (SFP) AOR maximum enrichment of 5.0 wt% U-235. SNC's evaluation considered the fissile material increase due to the higher enrichment and that due to the higher fraction of the theoretical density of the ADOPT fuel. The licensee established Technical Specifications to control the storage of the LTAs. The NRC staff has found that these controls provide reasonable assurance that the four LTAs as described in SNC's amendment and exemption requests will meet 10 CFR 50.68(b)(2), 10 CFR 50.68(b)(3), and

10 CFR 50.68(b)(4). See the NRC staff evaluation (ML23093A028) for further details.

Thus, the NRC staff finds that the requested exemption does not result in any undue risk to the public health and safety.

C. The Exemption is Consistent with the Common Defense and Security.

The proposed exemption would allow the use of four LTAs, each with four fuel rods with a nominal U-235 enrichment of up to six percent by weight. This change to the plant core configuration has no impact on security issues. Special nuclear material in the LTAs will continue to be handled and controlled in accordance with applicable regulations. Therefore, the common defense and security is not impacted by this exemption.

D. Special Circumstances

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR 50.68 is to provide reasonable assurance that an inadvertent criticality event will not occur during the storage or handling of special nuclear material at 10 CFR part 50 licenses. The preamble for the final rule promulgating 10 CFR 50.68 (*Federal Register* / Vol. 63, No. 218 / Thursday, November 12, 1998 / Rules and Regulations [[Page 63127]]) indicated that increases to the enrichment limit of 5.0 wt% U-235 could be addressed in the future. In the safety evaluation (SE) contained in ML23093A028 for the license amendment request, the NRC staff evaluated for Vogtle, Units 1 and 2, four LTAs that demonstrated the acceptability of the nominal U-235 enrichment of up to six percent by weight of four fuel rods per LTA. The results showed that the LTAs would not adversely affect subcriticality in the spent fuel pool or new fuel storage racks. Therefore, the NRC staff concludes that application of 10 CFR 50.68(b)(7) in this particular circumstance is not necessary for the licensee to

achieve the underlying purpose of the rule.

E. Environmental Considerations

With respect to its impact on the quality of the human environment, the NRC has determined that the issuance of the exemption discussed herein meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). The NRC staff's determination that all of the criteria for this categorical exclusion are met is as follows:

The regulation 10 CFR 51.22(c)(9) states:

Issuance of an amendment to a permit or license for a reactor under part 50 or part 52 of this chapter that changes a requirement or issuance of an exemption from a requirement, with respect to installation or use of a facility component located within the restricted area, as defined in part 20 of this chapter; or the issuance of an amendment to a permit or license for a reactor under part 50 or part 52 of this chapter that changes an inspection or a surveillance requirement; provided that: (i) The amendment or exemption involves no significant hazards consideration; (ii) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite; and (iii) There is no significant increase in individual or cumulative occupational radiation exposure.

Staff Analysis: The exemption is from requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR part 20. The criteria for determining whether an action involves a significant hazards consideration are found in 10 CFR 50.92. The proposed action involves installed four LTAs. As stated in the evaluation in ML23093A028, the Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, published in the *Federal Register* on November 8, 2022 (87 FR 67508), and there has been no public comment on such finding.

The proposed action involves installing four LTAs, and as the NRC staff evaluated under the SE contained in ML23093A028, this action does not involve any significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

The proposed action involves installing four LTAs, and as the NRC staff

evaluated under the SE contained in ML23093A028, this action does not involve any significant increase in individual or cumulative occupational exposure.

Based on the above, the NRC staff concludes that the proposed exemption meets the eligibility criteria for the categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the NRC's issuance of this exemption.

IV. Conclusions.

Accordingly, the NRC has determined that, pursuant to 10 CFR 50.12, the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances, pursuant to 10 CFR 50.12(a)(2)(ii), are present. Therefore, the NRC hereby grants SNC an exemption from the requirements of 10 CFR 50.68(b)(7) to allow the use of LTAs 7ST1, 7ST2, 7ST3, and 7ST4 each with four fuel rods with a nominal U-235 enrichment of up to six percent by weight, for up to two cycles of operation at Vogtle, Unit 2, and allow receipt, inspection, and storage of the LTAs at Vogtle, Units 1 and 2.

Dated at Rockville, Maryland, this 1st day of August, 2023

For the Nuclear Regulatory Commission.

/RA/

Bo M. Pham, Director,
Division of Operating Reactor Licensing,
Office of Nuclear Reactor Regulation.

